**Goals, Objectives, Tasks, and Subtasks  
Goals**: The goals of this work order are to incorporate information on sand filters into the Minnesota Stormwater Manual and work with the Minnesota Pollution Control Agency (MPCA) Project Manager(PM) to develop a simple Excel spreadsheet to calculate annual volume treated by manufactured treatment devices (mtds). This first goal (sand filters) will be achieved by developing information and guidance on operation and maintenance of sand filters. This includes links to case studies and other resources. The second goal will be accomplished by meeting with the MPCA PM to refine and modify an existing spreadsheet developed by MPCA.

**Goal 1, Objective 1**: The Contractor will provide information that updates the existing information on operation and maintenance (O&M) of sand filters in the Minnesota Stormwater Manual (manual). This includes reviewing available literature and, as appropriate, gather input from stormwater professionals, to provide a document and supporting information on the topic of O&M for sand filters. The information provided will be consistent with information contained on O&M pages for Green Infrastructure practices currently in the manual. The final memo(s) will include links as appropriate, references used to compile the information, and photos and other images as appropriate.

**Task A**: Provide an Overview of typical O&M: Provide a brief description of the practice and a bulleted list of common O&M concerns (issues)

**Task B**: Provide information on Design phase O&M considerations: Provide a summary and discussion of O&M considerations and recommendations made during the design phase for sand filters. Ensure the discussion is consistent with Major design elements described on the Design criteria for filtration page in the wiki. Specific to underground practices, identify the O&M components that must be addressed during the design phase, including but not limited to where structures are built and access for maintenance.  
  
**Task C**: Provide information on Construction phase O&M considerations: Provide a list of O&M items that need to be considered during the construction phase for sand filters. This includes providing information and/or links to information on erosion protection and sediment control, pretreatment, and design specifications. The discussion shall be divided into the following.

* Before construction O&M considerations, including stabilization of the contributing area and ensuring impervious areas are either clean or barriers and/or diversions are utilized, installing any erosion protection and sediment control practices, designating a stormwater supervisor, and holding pre-construction meetings as appropriate.
* During construction O&M considerations, including constructing pretreatment devices, minimizing compaction, storing excavated material, site inspection(s), and vegetation establishment.\
* After construction O&M considerations, including verification and delivering final information and reports.

**Task D**: Provide information on Post-construction phase O&M considerations: Provide a discussion or list of recommended O&M activities and considerations following construction of a sand filter. Provide the following tables.

* Overview and schedule of general maintenance activities
* Common problems and how to troubleshoot them

**Task E**: Provide information on Maintenance costs: Provide a list of cost considerations for O&M of sand filters. This section should be general and somewhat descriptive rather than specifying costs. It is appropriate to express costs relative to other costs for sand filters or other stormwater bmps (e.g. as a percent of a total budget).

**Task F**: Provide links to Useful resources: Provide a list of links to the following.

* Other pages or information in the manual
* External (non-manual) references for O&M of sand filters
* Case studies on O&M for sand filters.
* Example O&M plans, checklists, reports, and maintenance agreements. Note some of these may already exist in the wiki and can simply be referred to.

Goal 1 Timeline: October 2022 – June 2023